
Responses of Salt Tectonism and Sedimentation to Changing Regional Stress Fields

Peter A. Kukla, Geological Institute, RWTH Aachen University, Wuellnerstr. 2, 52062 Aachen, Germany, phone: +49 241 8095720, kukla@geol.rwth-aachen.de, Markus Mohr, Geological Institute, RWTH Aachen University, Aachen, Germany, and Janos L. Urai, Geologie-Endogene Dynamik, RWTH Aachen University, Lochnerstrasse 4-20, D-52056 Aachen, Germany.

Salt tectonics plays a major role in many sedimentary basins. One of the classic areas of salt tectonism is the Central European Basin hydrocarbon province where mobile Permian Zechstein salt formed a large number of salt walls, diapirs and pillows each formed by a distinctive interaction of tectonism and sedimentation. Our study is the first which quantitatively relates the Paleozoic to present day kinematics of the basin, salt diapirism and sedimentary response. We use seismic interpretation, based on prestack depth-migrated 2D and 3D seismic data, and retro-deformation to obtain a better understanding of salt tectonics, structural control, and sedimentary response in the German part of the basin.

Several salt wedges formed by lateral extrusions during periods of diapir emergence and reduced sediment accumulation can be identified. High resolution mapping and well-log analysis of the sedimentary stacking patterns displays the effects of syn-sedimentary salt movement that is consistent with the regional sedimentary, structural and stratigraphic framework. These near-diapir sequences which distinctly record salt-sediment interaction bear a number of potential hydrocarbon traps and present an excellent model for other salt-rich hydrocarbon systems.

Better understanding of the structural, sedimentary and salt tectonic evolution and improved knowledge of the position and amount of salt has furthermore effects on seismic modelling and depth conversion and advances the prediction of potential reservoirs in the sub-salt sequences.
